Ir McGee E-5 (1894-1895)1898 NU31 Seri NU31

bottoms literally writhing with fishes stranded among beds of mollusks and slimy with the abounding plankton of a fecund coast. The region is one of ample, albeit lowly, food supply, where every experience tends toward inert reliance on providential chance, and where the stimulus of consistently conscious necessity seldom stirs the inventive faculty. 227

Closely connected with fish as a Seri food-source are the various mollusean and crustacean forms collectively called shellfish; and these contribute a considerable share of the sustenance of the tribe. 262

Apparently the most important constituent of this class of foods is the Pacific coast clam, which abounds in the broad mud-flats bordering Laguna La Cruz and other lagoons of Seriland, and which was still more abundant during a subrecent geologic epoch, to judge from the immense accumulation of the shells in Punta Antigualla. The clams are usually taken at low tide, without specialized apparatus. They are located by feeling with the feet in shallow water, and caught either with toes or with fingers, to be tossed into any convenient receptacle. When the water is entirely withdrawn from the flats, they are located by means of their holes, and are extricated either with a shell-cup or with some other improvised implement. Frequently the entire mess is thrown into a fire until the shells open, when they are withdrawn and the mollusks devoured practically raw; perhaps more commonly the shells are opened by blows of the hupf, and eaten without semblance of cooking; and, except on the surface, no trace of roasting was found among the vast accumulations of shells in Punta Antigualla. 226 [252]

Perhaps second to the clam in frequency of use is the local oyster, which abounds about the more sheltered shores of Tiburon. It is gathered with the hands, aided perhaps by a stone or stick for dislodging the shells either from the extended offshore beds at extreme low water, or from the roots of a mangrove-like shrub at a medium stage. The shells, like those of the clam, are frequently opened by partial roasting; and shells, sometimes scorched, are extensively scattered over the interior, indicating that the oyster is a favorite portable food. The popularity of this bivalve is shared by the Noah's-ark (*Arca*), to which some mystical significance is apparently ascribed; and the abundant limpets and bivalves and other mollusks are eaten indiscriminately, to judge from the abundance of their shells in the middens. The ordinary crab, too, is a favorite article of food, and its claws are numerous in camp and house refuse; while the lobster-like deep-water crab is introduced into the menu whenever brought to the surface by storms, as shown by its massive remains in the middens. [262] [252] 262

On the whole, shellfish form a conspicuous factor in Seri economy by reason of the considerable consumption of this class of food; but, viewed in the broader industrial aspect, the produce is notably primitive, and significant chiefly as indicating the dearth of mechanical and culinary devices.

2: Kroeber E-5 (1930) 1931 NU31 Seri NU31

sounds like an expectable enough mythic idea, but seems involved with McGee's dubious conceptions as to totemism, discussed below. 114 193

The two-pointed fish-spear, with serrated points 6 inches long and spreading 5°, seen by Hardy (McGee, p. 193), is interesting because seemingly unreported in or near the area. 114 227

"Fishing" with staked pelicans who are then fed by free birds, is authenticated by the statement of Venegas for lower California, (McGee, p. 193). [226 231]

No fish nets, hooks, or lines were seen by McGee among the abandoned effects on Tiburon (p. 194). This is in accord with my observation. The abundance of sharks may interfere with net or deep water fishing.

The bow (p. 200) is of *palo blanco;* the release (pls. 28, 29), Mediterranean; the archer's position (pl. 29), with elbow above head, suggests a quick downward shot at a target or game lying on the ground not far away. 114 411

Mesquite, according to McGee (p. 207), is ground on the metate. Sr. Thomson told me of its being pounded in a hole in the ground. The Seri gave me the name a'kata for what I understood to be this earth mortar. According to Sr. Thomson's description, the flour from the first beans cakes and lines the cavity firmly, so that the bulk of the material is secured quite cleanly. In general, mesquite is mortar-pounded rather than metate-ground by the tribes from whom we have records, as is expectable from the woody nature of the beans. 114 252

McGee (p. 207) noted the viznaga cactus, Echinocistus, as rare in the Seri habitat, presumably owing to its use for water by the natives. I made the same observation on the mainland, but Sr. Thomson stated that along the roads the plant is being gathered for candying. 114 137

The one basket described by McGee (p. 208, fig. 24) is bundle-coiled and plain. The only one I saw in use among the Seri was ornamented with a plain reddish band. Sr. Thomson presented me with two which bear patterns (fig. 13), and showed me a photograph of a collection made by Mr. Davis for the Museum of the American Indian, Heye Foundation, nearly all of which were decorated, some fairly elaborately. Several of these are shown by courtesy of that institution in figure 12. As McGee observes, there is obvious resemblance to Southwestern baskets; especially of the Papago, Pima, and Apache. Southern California basketry is less similar. That of Baja California is unknown from specimens, though the mention of water-tight vessels used for winnowing and parching suggests a coiled tray of Seri type. The surviving tribes of Sonora other than the Seri use few baskets distinguishable from those of the non-Indian population. 114 285 [171]

Class	Species Reported	Species Exploited	Percentages
Mammals	21	9	43
Birds	24	6	25
Reptiles and Amphibians	25	11	44
Fish	44	23	52
Molluscs	36	21	58
Crustaceans	10	2	20
Total:	160	72	45

These figures show clearly the dependence of the Seris on marine life for a major source of their diet. Today, pista, baya, culen and sardineta are their primary source of income with meat and sea-turtles ranking second in importance. Several species of clams, limpets and gastropods supplement this diet.

All other animals represent only incidental additions to the menu. During the last war, sharks and mantas were hunted extensively for their liver, then a source of vitamin D. But since the war, the demand for shark liver has declined and because of this, a considerable income for the Seris has been lost. Shark and manta fishing have been abandoned for these fish were taken only for the commercially profitable liver and not for their flesh.

Fishing and Hunting

Seri fishing techniques are simple. In the past they used double-pronged spears and for the larger fish, harpoons. Today the spears are employed chiefly in fishing while the harpoons are reserved exclusively for sea-turtles. Hook and line fishing was introduced after 1930, as Kroeber (1931) saw none during his visit to Kino in 1930, and it is now the standard method of fishing. An abortive and unsuccessful attempt was made several years ago with net fishing. Another change has occurred within the past fifty years. The old balsas have been replaced by flat-bottomed plank boats outfitted with five-horsepower motors or sails. These motors, incidentally, are leased from the Mexican fish traders because none of the Seris are rich enough to own one.

Bait is obtained by dynamiting schools of small fish in coastal waters or by collecting them at low tide in the tidal pools and from under rocks. Fishing usually begins at dawn and lasts until noon when, as a rule, all of the "pangas", as the boats are called, return to Desemboque. In stormy weather no fishing expeditions are made and when this occurs, starvation becomes a real menace. Harpooning of sea-turtles takes place far out in the Gulf. It is done only at night in exceptionally calm weather by the light of torches or Coleman lanterns.

Hunting as it is done today has changed from the time of McGee's visit in 1894-95. The bow and arrow has disappeared completely except for a crude and diminutive form used as a toy by small boys. Iron spears once used in shark and manta hunting are now carried primarily as a weapon against the numerous and much feared rattlesnakes. They are said to be used occasionally in the peccary hunt. Old .22s or 30/30 rifles are owned by several of the men, some of whom specialize in hunting.

224 Game pursuit is usually done on foot, mostly in the winter and very little in the summer. The intense heat of the desert in the summer makes hunting unattractive. The most frequent trophies are the Sonoran bighorn, peccary, cottontail and jack-rabbits. Sometimes, semi-wild burros, running loose on the adjacent extensive Mexican "rancherias", are poached for meat. The peccary is the only animal hunted with the aid of dogs. Large rodents are dispatched by [223 417] sling-shot, stick, stone, or shot with a .22 caliber rifle. Birds, such as sea-gulls, ducks and pelicans, are clubbed, stoned or shot with a small caliber rifle.

462 While fishing and hunting are primarily men's occupations, the gathering 234 of the terrestrial and marine animals is almost exclusively women's work. 226 Rattlesnakes and other reptiles are often killed and brought to the encampments by the women from their morning trek into the desert after firewood and fruit. Small fish and marine invertebrates in the tidal pools are collected by women, aided by children of both sexes.

252 Preparation of meat is quite simple. It is either boiled in hot water with salt added as the only seasoning or else roasted whole, if small enough, over an open fire with or without a grill. The use of spices such as tomato sauce, [263] chili, peppers, and the like, depend upon the tastes of the individuals and also upon the availability of money.

225 In individual competence as hunters or fishermen the men show a great deal 224 of variability. Some excel in fishing while others do so in hunting. Hand in 226 hand with this, goes the degree of knowledge of the local natural history and, as expected, the best fishermen lead in the knowledge of fishes while the best hunters possess the most extensive knowledge of terrestrial animals and insects. It has also been observed that boys were far ahead of adults in their knowledge of inconspicuous or otherwise commercially unimportant creatures such as insects, obscure marine invertebrates and small fishes. Interest in the commercially or otherwise economically important forms of animals unquestionably becomes overwhelming in adult life while much of the natural history lore learned in youth is forgotten.

Food Preferences and Taboos

262 A number of animals were reported as being a part of their diet in the past but which were not used at the present time. Several species of shells collected from kitchen middens along the coast were thus identified. In some instances it has been denied that a certain animal was used for food; yet, later when such a beast was brought to the camp, it would be added to the menu. Undoubtedly, some of the species were held in low esteem as food and the Seris preferred not to admit eating them.

Large fishes, especially pinta and baya, sea-turtles, and the very large chuckawalla lizard, which is brought back from rare expeditions to San Esteban Island, are the preferred cuisine. Cochi fish, also called puercos, are disdained. Large catches of these were frequently brought in from the sea, only to be unceremoniously dumped on the beach and left to the dogs and the vultures. But when other fish were scarce, the puercos were eaten. Pelicans, once an

[89 cont.]

000 abundant flying and, especially, marine fauna.

For a modern technology, their region has great resources,
511 but for the culture of the Seri it is frankly inhospitable. The standard of living is exceedingly low, as is proclaimed by natives and foreigners and as is demonstrated by the illnesses and hunger that weaken the population.

[90] The Seri truly form part of our Western society, in
226 so far as they catch fish, with fishhooks and motorboats, to sell
439 in the markets of Hermosillo, Nogales, and Tucson, and they
[177] obtain payments in national specie and coin. The part that
182 they form, however, has its own internal structure, which regulates the relations with the environment and among its mem-
[161] bers, even though a group of 218 persons, which suffers severe alterations in percentages from disasters like the sinking of a boat or strokes of good luck like the establishment of a prosperous fishing camp, is almost insignificant for the nation.

Most probably they have never been much more numerous, and they must not have had great cohesion in the past, a situation explicable in view of their nomadic gathering economy.
621 Toward the close of the 18th century they were divided into bands, of which it is known that the most important were the Guaymas, Upanguaymas, Tepocas, Tiburones, and Salineros.
[648] They banded together at various times in order to defend themselves and to attack the nuclei of Mexicans of the zone, achieving combined action, but without effective political unity.

619 At present they seem to form a single group without marked subdivisions, although they recognize affiliations like that of "Tiburones," "half-Papago," etc., which appear to have little real classificatory significance.

184 There is great uniformity: they speak a single language
619 incomprehensible to the rest of humanity; they have a relatively uniform culture, and there is tribal unification for matters involving sexual exchange.

961 The most obvious relations are spatial; they have important settlements that sprung up around the fishing establishments and are more or less permanently occupied. Of these, "El Desemboque," close to the mouth of a river from which they have been displaced, is the most important, with 80 per cent of the Seri

[92 cont.]

156 854 155 They are principally the result of influences that act during the first years of life: constant contact of the skin with that of adults; immobilization of the extremities by cloth wrappings; provision of a permanent support in the form of a cradle to which the child is fastened; constant attention to his alimentary needs, and continuous supervision of his actions.

155 156 "Give me bread," "give me coffee," "you have food, I am hungry," "why do you keep food?" "that's the way things are," etc., are very common expressions that manifest the Seri personality.

000 On the other hand, from the practical point of view (3),

● 226 439 3. For the present fishing promoters, the Seri personality is a serious obstacle: because of the wealth of marine fauna, the competent Seri obtain a good catch in a few hours, and their earnings permit them to live several days, which would be multiplied if the yori would not resort to the sale of marijuana at excessive prices to obligate them to work. [276]

it has to be greatly altered, above all in so far as it influences the personality, in order to raise the Seri standard of living, changing their habits, ideas, and values.

POPULATION ABLE TO WORK
(between 11 and 65 years)

Men, 74 or 69% of the masculine population.
Women, 76 or 70% of the feminine population.

We can add that, at least as far as the male population is concerned, the figure of 69% with a potential work capacity is equivalent, in general terms, to the percentage of the population economically active, since one of the singular characteristics of the Seri population is the fact that they constitute a community fully occupied: all the men of working age have a place set aside in the fishing activities; this is an advantageous position for increasing economic development of the tribe. With relation to the women the situation is not the same, since the majority of girls of marriageable age carry on very few productive activities; it could be said that economic responsibility begins with matrimony.

If it is true that all the Seri men are fishermen, it is also true that there is the beginning of some specialization of jobs, which are carried on complementing or as an accessory to the principal occupation. Thus we have among the men:

Carpenters, constructors of *piraguas* (a kind of canoe)	6
Medicine men	14
Farmers	2

And among the women:

Seamstresses	4
Farmers	1
Midwives	22

The relatively high number of medicine men and midwives should not be surprising; Seri popular medicine is very well known and depends principally on magical propitiation and since the magic powers are acquired in a variety of ways, including dreams, and the healing rites are, on the other hand, very simple, it is not strange that medicine men should abound. As for the midwives, it can be said that every woman who has undergone the experience of childbirth feels herself able to help at a birth; nevertheless, it is said that the more experienced women are those best able to take care of those giving birth.

Problems which should be attended to

In addition to the sanitary problem mentioned above, mention should also be made of the problem of agriculture, linked with the necessity for supplying food to an Indian population which since economically it depends principally on fishing, needs to complement its diet with agricultural products to achieve a better one. In close relation

7: Marroquin E-5 (1955) 1957 NU31 Seri NU31

with this problem is the lack of legal title to the lands which the Seris own in fact but which legally belong to the nation.

Insofar as the economic problem, it is necessary to better the fishing techniques, doing away with old process of obtaining the catch through dynamite explosions. Finally, as Dr. Marroquin says, the fact should be noted that the Seris on passing from the nomadic economy to exchange economy lack the necessary knowledge to achieve success in their operations within the national and international market.

It is thus necessary to take care of these and other problems, to save this Indian group from complete extinction, succeeding on the other hand in raising their living conditions, making of them citizens capable of contributing to the progress of the State of Sonora and the Republic of Mexico as a whole.

NEW DIRECTOR OF THE SUMMER INSTITUTE OF LINGUISTICS IN MEXICO

For the next two years the Director of the Summer Institute of Linguistics in Mexico will be Dr. Benjamin Elson. Dr. Elson first came to Mexico in 1942 and began linguistic field work among the Sierra Popoluca Indians of the State of Veracruz. Sierra Popoluca has been the principal object of his linguistic studies since that time, and various articles have resulted from these researches. He took his degree from Cornell University with the thesis "Sierra Popoluca Morphology". He has on other occasions served as Associate Director of the Institute in Mexico.

The Associate Director will be Mr. H. J. Klassen. Mr. Klassen has done linguistic field work on Lowland Mixteco in the State of Oaxaca. He has served as Interim Director of the Institute on previous occasions.

VII ROUND TABLE OF ANTHROPOLOGY HELD IN THE CITY OF OAXACA FROM SEPTEMBER 1ST. TO 7TH.

During the month of September, the VII Round Table of Anthropology, dedicated to the study of the Indian cultures of Oaxaca, was held in the city of Oaxaca, capital of the state of the same name. Since at the present time there exists in this state a large proportion of Indians, and since during its pre-Hispanic past such important cultures as the Zapotec and Mixtec flourished there, the interest of this Round Table is evident.

Lack of space makes it impossible to present here a complete report of this anthropological meeting; therefore, we will limit our coverage to a summary of the most important points, taken from the Report of the recording secretary, Prof. Wigberto Jiménez Moreno. This report was made available to us through the kindness of Mrs. Carmen Cook de Leonard, Vice-President of the Center of Anthropological Investigations of Mexico. The complete version in English may be seen in the *Boletín* of the Center of Anthropological Investigations (Nº 4, Oct., 1957, pp. 43-49).

8: Ascher E-5 (1960) 1962 NU31 Seri NU31

McGee (1898:214)

estimated that maritime resources provided two-thirds of the Seri diet. Kroeber (1931: 20), approximately 30 years later, estimated the proportion at about three-fifths. In the winter of 1960, 30 years after Kroeber's visit, the Seri were obtaining at least three-fifths of their food from the sea.

In pursuit of their main source of subsistence, the Seri travel up and down the narrow coastal band. In the winter of 1960 they were occupying one temporary camp toward the southern end of the band and a permanent camp at the northern extreme. Seri women and children gather mollusks; fishing is a male occupation. In addition to gathering and fishing for their own needs, the Seri dispose of a portion of their catch on the commercial market. This enterprise began about 1930, and was encouraged by the establishment, in 1958, of the Sociedad Cooperative de Produccion Pesquera Seri with the cooperation of the Mexican government.

The Pacific green turtle constitutes the largest single item in the Seri diet for at least six months of the year—from January to June—and it is also caught occasionally at other seasons. In 1896 McGee estimated that it provided 25 per cent of the total food supply. Emphasizing the intimate ecological relationship between the Seri and the turtle, McGee (1898: 186-187) wrote:

> ... perhaps half of the aggregate life of the tribe is spent within easy reach of its [the turtle's] feeding and breeding grounds, and tribesman and turtle have entered into an inimical communality something like that of the Siouan Indian and buffalo in olden time. ...

Kroeber (1931: 20) believed that McGee stressed the Seri-turtle relationship too strongly and overestimated its contribution to the diet. McGee (1898: 187), in support of the importance of the turtle to the Seri, points to the fact that the turtle carapace is used for, among other things, a house covering and buckler, a cradle, a coffin, and footgear. The carapace is currently used for supporting and roofing houses and as a starvation food. The contribution of the turtle to the diet varies from year to year, but observations made in 1960 suggest a range of from 15 to 20 per cent as a reasonable estimate.

Seri men fish for turtle from boats, which are manned by two or three men and are propelled by oars, sails, outboard engines, or any combination of the three. The boats operate either individually or in groups. The men fish by night or day, depending on the weather and sea conditions. When they fish at night, they use a kerosene lamp to attract turtles to the surface. The principal implement is the harpoon.

The harpoon tackle of the Seri is illustrated in Figure 1. It consists of a foreshaft (c-h), a mainshaft (j-k), and an extension cord (i). The component parts of the foreshaft are a projectile point (c), a gasket (d), a wrapping cord (f), a hafting base (g), and a lead cord (e and h). In preparation for turtle fishing, the hafting base (g) is plugged into the socket (j) on the main shaft (k), and the extension cord (i) is looped through the lead cord (h).

262 I have no idea, of course, what the diet may
178 have been in the past since only archaeology can suggest the answer. But I am sure that there has been much change in their diet since Kroeber saw them, not in the basic pattern but in the composition. With the introduction of hook and line
[177] fishing, the percentages swung in favor of fish,
[226] while decimation of the marine turtle cut down the importance of this animal. Simultaneously,
262 the Seris now have available manufactured or
[177] imported Mexican food items: flour, sugar, rice,
[439] potato (when no one is looking; potatoes are not supposed to be sold to them because they make *tepache* from them which makes them grossly fish in cans, coffee and tea. Dependence on the products of the desert has dwindled. Rattlesnakes, desert turtles and chuckawalla still find their way to the Seri kitchen but not too frequently. Pelican and sea gull will be eaten only when rough times beset them but are disdainfully refused at other times. My own estimates, impressions not supported by any attempt to measure their diet, are as follows:

fish	50+%
turtle	8-
Mexican import	20
desert plant	7
desert land animals incl. stock	5
shellfish	10
total marine origin	68+
total desert origin	12
imported origin	20

224 Another important change in the pattern is the
178 unquestionable decrease of hunting (other than marine animals) in Seri life, as of the domestic
[685] stock stealing, the place of which has been taken in a way by the dependence on manufactured foods and items. Hunting nowadays is done rarely and only few individuals will devote some months out of the year to it. Stealing of domestic stock
[685] has ceased for practical purposes, since in the past it lead to virtual extermination of these Indians. Occasionally the Seri kill off a semi-wild burro, herds of which run about loose in the desert or they'll get leavings off one, hunted down by a Mexican trader or fishermen.

411 The Seris' basic tools of game procurement have
224 changed. Bow and arrow were still much in evidence and in use in McGee's time but seem to have gone out soon after. Kroeber did not mention them
[857] and by now they are quite extinct, except as clumsy toys little boys use to play with. The throwing stick is still used on rabbits—any stick one can scrounge on a moment's notice will do for the purpose. If any traps or falls had been used we do not know of them. Accidental stones may be used much in the same way as throwing sticks. In gen-
[177] eral, various sorts of fire arms, mostly .22 and .38 caliber are owned by a good many Seri men and have replaced other weapons in the terrestrial hunt.

226 More important are changes in the fishing pro-
411 cedures. Formerly spear and detachable harpoon
177 were their only marine weapons. Even as late as 1930, during Kroeber's visit, the Seris made no use of hook and line. But now, hook and line of

[P. 7A]

apparently a line of type has been omitted here-Analyst]

226 411 177 commercial origin are their main instruments of fishing. To this they added dynamite, sometimes with disastrous results to themselves, mostly as a way of securing bait. Single-pointed fish-spears which loomed so importantly in McGee's account have gone the way of the Dodo for its original purpose and transformed into iron bar lances, now used largely as weapons against rattlesnakes that men encounter in their desert roamings. However, in the forties, when the Seris spent a great deal of time getting sharks and huge rays, they killed them with these weapons.

226 411 What retain some importance are the harpoon and the two-pronged spear called "puiero." The two-pronged spear is one of their oldest weapons. The construction is much the same as when McGee visited them. The spear is used mainly to stab large-size fish, the giant *bais* or *mero* for example, after it has been brought up on the line. The [225] harpoon is now exclusively a weapon for the turtle hunt.

226 177 [157] An interesting fate met an effort to teach these Indians net fishing in 1947. They tried, ruined the nets and never took it up since. The instigators were Mexicans, the fish traders. I suspect that Seri individualism had a great deal to do with their lack of interest in net fishing which after all demands a certain amount of cooperation. With the hook and line fishing, men can have much more their own way.

501 177 648 An added "tool" of the Seris is the plank boat. The balsa which McGee still observed during his visit, had already vanished by the time Kroeber came to the Seriland and had been replaced by these boats. The boats are flat bottomed but good sized. The material was provided by the Mexican government. Boats are usually propelled by 5 hp. motors leased from the Mexicans (no Seri is rich enough to purchase [434] one) who also sell them gasoline and oil at exorbitant prices and in return buy Seris' catch of fish and sea turtle for low prices. At the time of my visits these amounted roughly to less than a peso [435] per kilo of the flayed, degutted and cleaned fish (less than 8 cents) with fluctuation up and down the scale depending on the kind of the fish, and to about 30-50 pesos for medium to large size "cahuama," the live marine turtle.

501 648 The Seri boats are also propelled by paddles and sail—this is always the case with the families who wish to stay away on Tiburon for some time. The Mexicans will not lease them their motors for such trips even if the Seri, some of them at least, have enough knowledge of the motors to repair minor stoppages—a demonstration of the fallacy [114] of McGee's idea that they are genetically unable to handle tools. In this respect, Kroeber's (1930: 25) estimate of them is closer to the truth.

462 [434] Sexual division of labor in procuring food goes on, much the same as it had 70 and 30 years ago, with the sole exception of the imported goods. Here purchases are made either by men or women or by children, depending on who at the time has the cash and what one wishes to buy.

Fishing is still done by men and so is hunting. Women still concentrate on gathering, whether of

9:Malkin E-5 (1953-1955)1962 NU31 Seri NU31

VI

FISHES

Taxonomy

* 825 The Seri have considerable skill in differentiating between different species of fishes. There are two main groups which they recognize but which in their own mind are entirely unrelated, the fishes and the sharks. It is also certain that they consider the mantas and sting rays as creatures allied to the sharks and not to the fishes. To the Seri sharks and mantas are not fishes at all but entities of their own. It appears that there are two bases for this distinction. Fishes, as Seri see it, always lay eggs; sharks and mantas do not but instead deliver young alive (in fact some do and some don't). Secondly, the peculiar dimorphic structure in the sharks and mantas, the claspers present in the males of both, not only suggest to the Seri the male sex but also an association with another group.

On the whole, the Seris were able to distinguish as separate species almost all of the fishes for which they were questioned. There is confusion in a few instances. Although *Totuava* and the *Pinta* they think are separate, the evidence suggests that here they actually distinguish merely individuals of different age that belong to the same species *Epinephalus analogus* and that the mature individuals are called *Totuava* and the immature *Pinta*.

An interesting situation arises with the *Myrichtys tigrinus*. This peculiar and remarkably snake-like fish is considered not a fish at all but a snake. The Seri know nothing more about it, and this is where the association ends in their mind. For taxonomic purposes, this fish is included among the fishes but it should be remembered that this is not what the Seris think.

With the exception of three more species of fishes, *Ogilbia*, *Lutjanus argentiventris* and *Conodon serifer*, the Seris had at least some knowledge of the natural history of each species. But in these four cases they could say nothing, nor have they recognized the last three.

Economic Uses

●226 177 According to McGee, the sea turtles and the marine molluscs are most important in the Seri economy, with the fish coming in the third place perhaps. Today the situation has changed radically. The fish became the very basis of the Seri subsistence, with the marine molluscs falling into third or fourth place in order of importance. One good reason for the change has been the revolution wrought in their fishing method with the introduction of the hook and line. This must have come into the fore after 1930 and became the dominant method of fishing after 1940. The Seris did learn to use hook and line from the Mexicans

[P. 31 B]

226 177 [411] [225] and, from all accounts, also from the Japanese whose trawlers worked in the Gulf in the late 1930's. Today, hook and line fishing from plank boats almost completely replaces earlier methods, the spear (pueiro) and the harpoon (barilla). Harpooning is still done in hunting marine turtles while spears are occasionally used on larger groupers and also on sharks and mantas. Harpoons were also used in connection with the latter. But since World War II the shark fishing has declined, owing to the development of synthetic vitamins and abandonment of sharks and mantas' liver oil as a source of vitamins. In these operations, the Seris were for a while involved to a considerable extent. But now they have completely switched to commercial fishing which supplies not only food but also ready-made cash from [439] the Mexican traders, and with it the Seris can purchase luxuries of life in the Mexican *tienda*.

262 Altogether, out of 42 species listed here, the Seris reported taking for food 20 species which are as follows:

Malacosteuus zonifer
Firella simplicidens
Anisostremus davidsoni
Paralabrax maculafasciatus
Luthrulon flavigultatus
Mugil sp.
Cynoscion parvipinnis
Anchovia macrolepidota
Bairdiella icistius
Stereolepis gigas
Mycteroperca jordani
Cynoscior macdonaldi
Epinephalus analogus
???? (Pescara)
Trachinotus paitensis
Verruculus polylepsis
Gymnothorax castaneus
Hypsoblennis gentilis ricketti
Abudefduf saxatilis

The most important of these are the groupers, the *baya*, *pinto*, *totuava* and *mero*—the latter a giant fish often in excess of 150 kg. and nearly three meters long. The most important of these is the *baya*, a medium size fish taken daily in vary- [226] ing amounts. I suspect that this fish accounts for more than half or maybe even 2 3 of the total Seri catch, weight-wise. Of others, none is of any importance except seasonally.

* 825 Another sort of use is made of the sharks and mantas in connection with the already mentioned exploitation for liver. Five species of sharks and the horned manta were listed by the Seris, with *chata*, *gato* and *composo* most frequent and perhaps most important.

Trading, as already mentioned, is of considerable importance to the Seris. Some fish are eaten [439] only occasionally, but they may be traded off to the Mexicans.

262 Not all fish are eaten. In most cases no particular explanation had been offered for the rejection. But, in some, specific reasons were mentioned. The *Scorpaena sonorae* and *Cetengraulis mysticetus* are so rejected because they "are too bony to eat." *Gillichthys seta* are considered unfit to eat because of its tiny size while *Sphoeroides annulatus* is refused because of its supposed toxicity, of which more later. Finally, the sharks are not eat-

[P.32 A]

262 en simply because their flesh is disliked and unfit for human consumption. But it may also well be that some of them, especially of the giant variety, are not eaten simply because they are far too large to tackle and the Seris fear hunting them.

The Seris indicated also in some cases that larger specimens of fishes are eaten when they reach the size which would justify the effort. This is true of *Malacoctenus zonifer* which they indicated is "eaten when large," that is when at least 10 cm. long.

●[226] Although only sometimes did the Seris specifically indicate that certain fishes are used for bait, it is very likely that almost all small or lesser fishes are so used.

262 178 In some cases the Indians indicated changes in preference for given fishes, with the time. For unexplained reason *Gymnothorax castaneus*, the morene, has been claimed to have been eaten in the past but not for the last 11 years. It isn't clear why the figure of 11 had been used and why suddenly in the early 40's they should stop eating it while the Mexican drool over it. But it may be also that here we have merely personal preference of the informants, as so often happens. As for the *pescara* it was formerly taken for food [439] but now it is merely sold to the Mexicans. This practice is increasing also to include the immense *mero*, even larger than the *pescara*. The fish is mainly sold but rarely eaten by the Seris themselves.

Food Preparation and Preferences

252 Food preparation is simple and in the main differs not at all from the preparation of other animal diet. The fish are either boiled whole or in part or else are roasted over slow fire on a grill. The entrails are usually discarded, but otherwise the beasts are eaten entire, eyes, brains and the rest, while the tiny fishlets are eaten complete with the scales and guts.

262 As for the preferences, as expected, there are some fishes that the Seri like better than others. The *bam* in the first place and the *pinto* in the second lead the list. The Seri prefer them to all others and consider them a real delicacy. On the other hand, there are some fishes that they'll eat only under protest, meaning when times are hard. *Girella simplicidens* is one such creature. The *Puerco* or *Cochi* is another. I have seen boat loads of puercos brought in with the other fish and un- [231] ceremoniously dumped out on the beach to the dogs. Literally! The Seris took to this fish only when fishing was poor during the wintry days when they were held ashore by the weather. Even [183] then, they tried to eat the despised creatures on the sly, avoiding being seen doing this, and when I or the Mexicans picked up fresh fish from the beach to take home they laughed saying that we acted as a *cochi* (pig) would!

Other Economic Uses

* 825 237 322 One use made of fish concerns two species of sharks, the *chato* and *camposo*. Here, the informants claimed, the oil from their liver had been used in earlier times for polishing wood. This is

* 825 quite possible but I couldn't substantiate the story
237 from contemporary evidence. Perhaps during the
height of the shark hunting for the liver oil, the
[322] Seris used the oil also for wood polish, although
it isn't very clear just what sort of artifact they
make would require such treatment. The wooden
tools or artifacts among them are in short supply
at all times. Finally, the huge horned manta was
supposedly hunted also for its hide but just in
what circumstances it was not explained. It is the
only fish which the Seri ever mentioned as having
been put to such use.

Fishing

●226 As already mentioned, fishing nowadays is
largely accompanied from flat-bottomed boats
with hook and line. The old ways of getting fish by
spearing are almost gone for good. Recently, an
[177] attempt has been made to teach the Seris siene
fishing, but 10 years of these endeavors accom-
plished only ruination of a number of expensive
nets and of much fishing gear and the desertion
[157] of the project by the Indians. It may be that their
individualistic and almost anarchistic attitudes
preclude cooperation, essential in this type of
fishing.

The bait is obtained in any one of the three
ways: by dynamiting fish in tide pools or
along the shore, or by catching small fry with
small hook and line, or finally by collecting small
fishlets in the tide pools, prying them out from
[857] under rocks or simply—and here the Seri boys ex-
cel—by shooting them in the tide pools with tiny
toy arrows or simply spearing them with a stick.
[177] The dynamiting is done with the purchased sticks
of dynamite which the Seris obtain in the tiendas.
The procedure is often risky and down right dan-
gerous. Some of the Seris have blown themselves
up with dynamite. I have seen one of them, who
lost both arms and had a jaw broken during a
dynamiting trial. He went about with a dirty rag
tied up over his head to support the wrecked
[164] jaw-bone. He was carried off by measles two years
later in the 1955 epidemic.

226 The Seris' commercial fishing is pretty much
648 controlled and exploited by the two or three Mexi-
439 can fish traders from Nogales and Hermosillo.
These have their tiendas in Desemboque, which
443 at set price sell things to the villagers. They also
provide the Indians with the five horse-power mo-
[501] tors for fishing trips and pleasure cruises and with
the oil and gasoline essential to run these—also
at set price. They finally purchase the fish—at a
set price—and from the proceeds the Seris pur-
chase goods at the tiendas, completing the cycle.
Not all Seris are compelled to work for the Mexi-
cans, and, in fact, they do not always do so. Some
[501] families stay away from Desemboque and depend
on the sail and oars for propulsion. They come to
the village only once every few months to obtain
supplies. Even when in the village, the Seris make
little effort to fish for more than they wish to get
in order to satisfy their immediate needs.

226 Fishing expeditions usually take place in the
morning. Most Seris will set off before daybreak
and will return with the catch by 11 a.m. or noon.

●226 Occasionally they'll stay a little longer and when far off in the Gulf, they will return only in the afternoon. But this is not frequent. Some of the bait catching is done during the night by the light of torches or Colemans.

As already mentioned, unfavorable weather may put off fishing for several days and when that happens, famine becomes a real menace to the Indians because they have no supply of food stored away for the lean day and no cash for such purposes.

[731]
[251]

Sexing

*825 Sex differences in fishes have been observed by the Seri probably in the majority of the species from the list, although for several there is no data available. The tabulation breaks down by the number of species as follows:

	number of species
Sex differences observed	22
Sexes alike in all respects	6
Didn't know what differences there are	6
No data	8

The six species in which sexes are considered indistinguishable in size and color and in other respects are *Pescara*, *Pinta*, *Baya*, *Pinturera*, *Smyrna* and the undertermined shark *sp. C*. The inclusion here of the most important economic species such as *Pinta* and *Pescara* and of the sharks is interesting. It shows, in the main, probable lack of information rather than ignorance of differences on the part of the Indians. It was probably an oversight in questioning, for surely the sharks' sexual differences are usually known to them and it is improbable that they could never tell the difference between the sexes of their most important marine game.

The species in which they expressed puzzlement over the differences and simply indicated that they didn't know the answer were largely little known forms about which they could tell very little anyway, either because they occurred far away from their territory like, for example, the flying fish and the tuna, or otherwise were obscure species, too small to pay attention to, or finally, the huge monsters, too big for them to hunt and approach for more careful inspection.

In more detail, a number of different sexing criteria seem to be employed by the Indians. These differences are tabulated below:

Males larger	Females wider, larger in bulk, but length the same
Abudefduf saxatilis	*Cydoscion macdonaldi*
Gymnothorax castaneus	*Trachinotus paitensis*
Girella amplicidens	*Cynoscion parvipinnis*
Aniaotremus davidsoni	*Mugil sp.*
Gillichthys seta	*Bairdiella incistius*
Sphoeroides annulatus	**Males more brightly colored**
Parcques viola	*Paralabrax maculofasciatus*
Females larger	*Hypsoblennius gentilis*
Epinephalus analogus	

Other sex differences considered by the Seri are structural and appy to the sharks. They associate the presence of the "2 penises" in the sharks and mantas with the males and their absence with the females. The "penises" are, of course, sex claspers present near the vent in the male sharks which aid them in holding up the female during the mating. These differences had been observed

[P. 33 B]

*825 fishes, the larger the species, the larger prey it takes. *Lisa*, *sardina*, *sardinera*, small *pinta*, *puerco* were most frequently mentioned as victims of predation. The *sardinera* is supposed to feed on the sardina, hence, they say, it takes its own vernacular Spanish name. Finally, in the upper size limit, among the largest, mantas and sharks, they say there are no enemies—the size of the fish eliminates any danger.

●226 The frequency of predation has been noticed by the Indians and, as a result, they often use appropriate kind of bait for the kind of species they wish to capture. Thus different kind of fish or an octopus will be used as a bait for the species they think feeds on these rather than on other animals.

Development

*825 The division of fishes into viviparous and oviparous is clear cut. Of the 33 species for which detailed responses are available 23 are considered oviparous and 10 viviparous. All of the latter are sharks and mantas. The knowledge of this fact stems unquestionably for the most part from the relatively recent experience in hunting these animals for the liver. Even though at present this occupation went into disuse, the knowledge gained in the course of it still persists.

The responses indicated that the larger the shark or the manta, the fewer young it will have. And, in fact, the informant indicated this by a blanket statement to this effect. The largest creatures in this group has, they say, two young as a rule; the smallest, a dog-fish, will have 12-14. An exception is the smaller sting ray which they claim will have 1-2 young .

The rest of the fishes carry roe and deliver eggs. The number of the eggs has always been indicated as "many" but sometimes a stab at a figure was made and, for example, *Anisostremus davidsoni* is supposed to have about 1000 of them. It appears that the Seris were convinced that a fish which is not a member of the shark family is automatically an oviparous creature. Even when not familiar with the roe of a certain species of fish they were apt to indicate that it must have it.

There were few negative responses and these were largely associated with the little known forms. Tuna, flying fish and the snake-like fish *Myrichthys tigrinus* which they think is a snake and not a fish belong to this category. Exceptionally, one of the better known fishes, the *corvina*, was also in this group and it is difficult to explain this ignorance of its natural history.

When the fishes mate is a mystery to the Seris, and, for some reason, there is little association between the mating and delivery of the eggs. This is all the more strange, because mating takes place immediately after the delivery of the roe. This suggests that the conventionalized Seri idea includes a time lapse between mating and delivery of the egg or the live offspring in most animals. How this works could be seen in the birds and mammals. The only instance when mating season has been pinpointed by the informants concerns the horned manta which they say mates

Bimalkin E-5 (1953-1956)1962 NU31 Seri NU31

825

analysis of the data given for the individual species. Where such data are available, for 21 species, fully 15 show preference for this kind of habitat and only six, it is said, prefer sandy bottoms. In many instances, such ecological preferences had been very emphatically pointed out and the informants denied that the animal lives over either rocky or sandy bottom, as the case might be. Geographical distribution has often also been indicated in the same manner, and explanation for the presence or absence of a fish in a certain place has been represented in just these terms. But this will be discussed later on. On the whole, the rock-loving fishes are all of the small species and economically not particularly important. The six sand loving species are:

Sphoeroides annulatus
Lythrulon flaviguttatum
Myrichtys tigrinum
Mugil sp.
Cynoscion parvipinnis
Bairdiella incistius

There are a few more factors introduced into the ecological considerations. Sometimes ecological preferences had been indicated for the large and immature individuals of the same species. Thus the big *mero* "live in deeper water 25 meters or more deep" while the "little *meros* go to the Esteros." The large shark *pinturera* is said to be absent from Desemboque because "it is too shallow there" and this presumably holds true also for other sharks. A similar situation pertains to the sting ray where the smaller individuals do come to the bank. Sometimes the fish may keep to the deeper waters but stay on its surface, and here, the Seris say, belongs the *choveta*, a small fishlet, traveling about in countless schools.

Distribution

The distribution charts of fishes indicate in the main the Seris' familiarity with the coast. The locality near which they live or places where they fish show the great number of species listed by them as present. The further away from Desemboque and Tiburon, the fewer species are listed. The Seris do not go to the coast of Baja California to fish, hence no species are listed for it. Those that are marked so are the species which the informants included under a blanket statement "present everywhere." The basis for this kind of statement seems to be the frequency and numbers of fishes that are encountered.

[484]
[226]

On the other hand, there are a number of such records that are indicative of the ecological preferences and frequently a fish might be marked

[P. 37 A]
1 [see category 116 - pp 63-64. - Analyst.]

*825 for Desemboque or Porto Libertad but marked negatively for Porto Kino and reverse. Kino is sandy, Desemboque is rocky. Hence the difference.

With two exceptions, all sharks are marked as ubiquitous but sticking to the deeper waters of the Gulf or as the Seri would express it "found in the Gulf." This sort of thing is hard to mark on the chart and therefore a blanket statement covering all such is indicated.

Toxic or Dangerous Fishes

Very few fishes are considered really dangerous or aggressive. There is a generalized notion, undoubtedly not entirely unfounded, that the large sharks are dangerous and that they'll make dinner of humans if given an opportunity. They are also feared for their strength and for the size of their teeth, regardless of whether or not they are aggressive. The huge sharks, most likely the whale sharks, had not been hunted by the Seris, so the informants say, owing to their size and brute strength. Larger real fishes, *mero* and *totuava*, are also considered large enough to throw men into water, though not aggressive. The same goes for the manta. [226]

The smaller mantas and the sting ray are greatly feared, owing to their possession of a nasty spine with which they can sting badly. The smaller sting rays are particularly feared in this respect because they bury themselves in the shallow sandy beaches and cannot be seen. The sting is painful and is also considered toxic although the toxicity is actually due to the accumulation of slime and danger of infection.

Two other fishes are considered toxic but harmless. *Myrichthys tigrinus*, which, as already mentioned, is believed to be a snake, is said to have venom but is harmless because it does not bite. *Scorpaea sonorae* is also believed to be venomous and "the venom is located in the spines in the fins." This creature, the Indians say, may inflict pain which will last for a full day. Finally there is the odd case of the little *Sphoeroides annulatus*. This one is thought to be venomous in the flesh and therefore dangerous to eat. The explanation for this was offered as follows: "100 years ago a Seri man ate one and died of its venom. It was very long ago. Maybe 100 years." [262]

It is difficult to account for this story unless someone actually ate a fishlet so utterly rotten that septic reaction set in and the man died of food poisoning. It is also not likely that such a trivial event would be remembered as far back as 100 years ago.

[P. 39 B]

MOLLUSCA

VII

USES

Species	Food		Decoration		Trade		Bait
	Pres.	Past	Pres.	Past	Pres.	Past	
Octopus bimaculatus	x	x				x	x
Codakia distinguenda		x					
Laviocardium elatum		x			x[1]		
Carditamera affinis	x	x					
Acmaea dalliana			x	x	x		
Crucibulum spinosum		x	x	x	x		
Chione undatella	x	x					
Chione californiensis	x	x					
Pteria peruviana	x	?	x	?	x		
Volsella capax	x	x					
Olivella dama			x	x	x		
Cypraea annettae				x[2]			
Tegula rugosa		x		x		x	
Conus regularis		x[3]		x	x	?	
Phyllonotus erythrostomus		x				x	
Turritella brodeiana		x[3]			x	?	
Polinices reclusiana	x	x					
Chlamys subnudosa	x	?					
Atrina maura	x	?			x[4]		
Navicula pacifica		x					
Turbo fluctuosa	x	?			x		
Solenostira pallida			x	?	x		
Ceritium stercusmuscarum			x				
Trivia radians			x				
Ficus ventricosus	x						
Nioche bistrinnoca	x	x					

[1]Occasionally used as dip spoon
[2]Supposedly used in the past for money
[3]In the past "giants of 300-400 maybe years ago have eaten it."
[4]Only pearls

These figures show then 26 out of 37 species exploited economically in some way, that is 70%. These figures show increase over the figures I have published previously (1956) which were 21 out of 36 species and 58% respectively. The corrected figures are the result of brief additional field work in 1955.

Food

A good part of the molluscan forms are used as food. Altogether 19 species are listed as such, although out of these, only 11 were reported as being part of the diet today while the remainder only in the past. It is obvious that there has been progressive decrease in the Seris' dependence on the molluscan diet within the past few generations.

Four of the species reported as part of the Seri diet at various times had been collected from the kitchen-middens. There are: *Pteria peruviana*, *Chlamys subdudosa*, *Volsella capax*, and *Navicula pacifica*. Of these four, *Navicula* has been reported as eaten in the past "maybe 100 years ago, but not

[P. 38 B]

301 + 825 worn. I have observed women wearing necklaces of the former and women and very young boys of the latter. The olive shell, incidentally, is made into two sorts, the natural, unroasted shells which retain a greenish-purple, mottled color and the white. The white pallid color is achieved by roasting the shells over fire. The necklaces are mostly made up of either colored or white but occasionally they may be made of mixed shells and then they are usually alternately interlaced, now with one, now with another.

+ 825 b) *Utensils:* Two species had been reported used as occasional drinking or dipping cups and spoons. *Lavicardium elatum* and *Ficus ventricosus*. *Ficus* is presently discarded, but the *Lavicardium* is still occasionally used so. There is no doubt that the incidental use of these shells increases during longer fishing expeditions when the Seris are apt to lose some of their gear. [412] [415]

[436] c) *Money:* Interestingly, the brown cowry was supposed to have been used as a means of exchange, as money—in the past. If this is so, then the selection of this shell for such purpose is not [171] surprising considering its widespread use throughout the world.

439 + 825 d) *Trade:* Altogether 12 species had been reported as traded off either in the past or present. The trade importance of various species of shells varies with the demand of the market and sometimes may be only sporadic and short-lived. Only a few of the species had been indicated as having been of any trade importance in the past, and it may well be that the Seris did not register the species which may have been briefly sold to and outsiders during the short-lived fads of demand. It may be said in general that the trade importance of the shells increases and that greater variety of them are exploited now than formerly. This is surely owing to the increasing accessibility of the Seri country and the increasing tourism, not only visitors from Hermosillo, [177] but also from such far flung places as Tucson, Phoenix and even Los Angeles.

In some instances, the Seris had no idea what the shells were sold for. The augur shell is on and off sold to some American traders who show up in Desemboque once in a while and for whom the Seri women accumulate these shells. But what uses were made of these, the Indians surely didn't know. Neither did they know what uses were made of the *Murex* shell and the *Turbo*, both of which were periodically sold in bulk to Hermosillo. On the other hand, they had some idea what uses were made of some other shells. *Pteria* and *Atrina* contain pearls and these are much desired. Especially the pearls of *Atrina* which are sold to the [435] Mexicans or to the visitors for 25-50 pesos each and therefore have immense value, for the local market. The *Pteria* shells are said to be used for [237] button making, and the Seris themselves claim that they make buttons of this shell. The most important of all, however, at least at the time of my visits in 1953 and 1955, was the olive shell. It was easily the most commonly and most numerously collected shell of all that the Seris ever [226] collected. Owing to the scarcity of it in Desembo-

*825 439 [226] [415] [435] que (as a result of the ecology of the coastal waters) it is gathered in huge quantities largely on the shores of Tiburon where it is said to occur in great numbers. This animal is gathered in large bulk in 5 gallon gasoline cans and then sold either as finished necklaces at the rate of five pesos each, or as bulk, by the liters, with 20 liters for each gasoline can. There is a steady market for these shells.

226 e) *Bait:* Only the octopus has been reported as used for fish bait for the *pinta*, *baya* and *pescara*, and I have seen it used in that manner. But it is certain that on occasion the Seri will use also for bait the flesh of some of the shelled smaller molluscs, especially when they wish to capture live fishlets for bait.

Hunting

[462] [857] Collecting of molluscs is almost invariably a job of adult women and of the children of both sexes who at low tides scavenge the exposed mud flats and gather or dig out various marine animals. Some are collected on the surface only. Among those that must be excavated are the octopus and *Nioche* which hide in burrows or mud, respectively. A large shell is usually used as a tool to pry the *Nioche* out.

Taxonomy

*825 Molluscs on the whole are recognized as one group of animals. However, this does not include the octopus and the chitons which are considered as different sort of creatures. Some sort of feeble association between the *Pelecypods* and the *Gastropods* is recognized and various species of both are placed together. I noticed a tendency to consider some of the *Gastropods*, the limpets and *Crepidula* for example, as supposedly having two valves while in fact they are both univalves. The explanation offered for this was "it lost one side," meaning one valve.

Although *Chitons* spend most of their time motionless attached to rocks they are both considered animals. The motions of these animals may not [857] have been observed by the adult, but the Indians, young boys especially, certainly noticed the changed positions after a period of time.

In some instances the Seris observed quite small differences between animals—recognizing them as different species. In the *Neritina* two different forms were correctly identified as representative of the same species, although they differed considerably in size and color. On the other hand *Columbella* and *Solenostira* had been given the same Seri name palémex[x] but were recognized as different kinds of animals.

Sexing

A distinct tendency to consider the molluscan males larger than the females emerges readily from the Seri answers. This can be shown in the table below:

[P. 40 A]

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[P. 40 A]

VIII

CRUSTACEA

Scientific	Common Name
Cirripedia	Barnacle
Axius vivesi	Mud-shrimp
Leptodius occidentalis	
Microphyrus platisoma	
Speleophorus schmitti	
Petrolistus armatus	
Callinectes arcuatus	
Glyptoxanthus meandricus	
Pilumnus townsendi	

All animals in this group are considered live animals—and not plants. This interestingly includes the barnacle. The only way one may account for this is probably the Seris' observation of the cracked barnacles and of the moving flesh inside. Barnacles growing on the marine turtles are also classed as animals, though of a different kind than the barnacles growing on rocks or on the mangroves. They are called *piojos de cahuama*, literally, turtle lice.

The Seris regard *Glyptoxanthus* and *Pilumnus* as the same kind of animal. *Pilumnus* is considered to be merely a large specimen and "maybe an adult," the other *Pilumnus* "is young." When questioned about the reason for the identity the informants pointed out the hairiness of both crabs.

On the other hand, although *Spelenophorus* and *Microphyrus* have the same Seri name, they are considered two different species.

Economy

Crustaceans play little role in the Seri diet. Very few are eaten at all and when they are, the amounts are insignificant and they are considered an inferior sort of food. The informants denied that they have eaten any of them in recent years, but allowed that two species, *Callinectes* and *Axius*, had been part of their diet in the past, although how long ago they didn't specify. There is no doubt, however, that in time of frequent sub-famines, the Indians resort to these lowly creatures.

In addition to this, *Microphyrus* had been mentioned as a fish bait. It is possible that in a pinch other forms are also so used. Finally, the most frequent function that the crustaceans play in the Seri life is as objects of play for the boys who spear them with the miniature two-pronged "puieros."

Sexing

For three species of the crustaceans the Seris indicated distinction differences between the sexes. In the two crabs, *Callinectes* and *Leptodius*, the males have narrow center plate while the female's center plate is wide, which in fact is a well-known sex difference in crab. In *Glyptoxanthus* and *Lep-*

9:Malkin E-5 (1953-1955)1962 NU31 Seri NU31

XI

SUMMARY

In 1956 (Malkin 1956:74) I published tables indicating the degree of economic exploitation of the animal world by the Seris. These tables were incomplete and also need corrections. Therefore below I am reproducing the revised version.

Class	Species Reported	Species Exploited	Percentages
Mammalia	21	9	40
Birds	24	6	25
Reptiles and Amphibia	25	17	68
Fishes	44	23	52
Molluscs	37	27	70
Crustacea	10	2	20
Insects	92	—	—
Miscellaneous	9	—	—
Totals	262	82	30

These figures show as yet remarkable degree of exploitation of the products of the sea and also of the reptiles with correspondingly lesser interest in the terrestrial animals in general. Of course, mere listing of animals does not tell the whole story. In the first place, it does not indicate the changes that took place nor does it suggest the relative importance of any group or species. Historically, the situation is different now. Out of nine species of mammals reported as eaten only six still figure out in the diet. The reduction is even more striking in birds where only three are admittedly eaten and two of these only furtively. More yet, only 12 species of marine molluscs out of 27 are eaten while the rest get discarded. All this is tied up then with the changes in the economy, with the importation and increase of the trade foods and goods and also with increasing preoccupation with the commercial fishing at the expense of hunting and gathering.

Individually, by far the most important in the Seri diet and economy are the fishes with half a dozen large commercially lucrative species leading the list. Next come the marine turtles and following these for the third place tie the molluscs, the mammals (lagomorphs, bighorn and peccary) and probably the rest of the reptiles of which the rattlers are probably most important by volume. Insects do not figure any longer in the Seri economy in any way, although at one time they probably had some significance. On the other hand, while the food importance of the molluscs decreased immensely, their trade importance is on the upswing owing to the demand from the outside. Thus the basic changes in the Seri patterns of exploitation of animals has been a result largely of an outside stimulus.

Fishing and Hunting

Fishing is practiced mostly to satisfy the immediate needs, of petty cash and food: Once these are satisfied, there is no incentive to fish until the need arises again.

[P. 54 A]

123 As a concrete result of that first trip to Tiburon, I secured a
115 *balsa* (boat) made of *carrizo* canes lashed together with native fibre,
501 which *balsa* Mr. Heye said it was the finest one in North America.

• [226] This *balsa* was given to me without hesitation, although it furnished one or two families with sea food.

115 I wish to pay tribute to Senor Roberto Thomson who has been my constant companion, friend, guide and interpreter during the past twenty years, on all my trips to Tiburon and various parts of Mexico. I found him absolutely dependable, using excellent judgment in critical situations. He was honest, fair, intelligent, looking out constantly for my safety and comfort always, enduring hardships cheerfully. A better all-round out-door man I have never seen equaled. In short, he is a real *hombre*, and *muy simpatico*.

131 Tiburon, or *Shark Island*, long noted for its evil reputation as
181 the home of the most savage and treacherous Indians of North America,
193 lies in latitude 29°north and 112°30' west longitude, in the Gulf of California. It is shaped like a parallelogram about thirty-five miles long and eighteen to twenty miles wide, and lies parallel to the coast of Sonora, Mexico, of which, no doubt, at some remote period, it once formed a part.

It is separated from the mainland, for the most part, by a strait called *El Infernillo*, or The Little Hell, through which the rising
[137] tides pour a resistless flood. It is a desert island and supports a desert arboreal vegetation which includes several varieties of the cactus family and the *mesquite, palo verde, palo fierro, torote, palo blanco, ocotillo* and others. The giant *saguaro, zarbaso* and *pitahalla (pit-a-haya)* cactus are found here also.

Two desert ranges run lengthwise of the Island, which, on its westward or windward side, terminate in sea-worn cliffs against whose ramparts dash the heavy breakers of the Gulf, and on its eastern side, by long alluvial aprons from the foot of the mountains, sloping gently down to the lovely shell-strewn beaches. From this side the foot of the mountains lies from two to five miles distant. On this, the leeward side of Tiburon, the sea is much calmer, and often, in the early morning, it is as smooth and placid as a lake, reflecting each rosy, lavender and purple tint of the rugged Sierra Seri along the Sonoran coast, as in a mirror. The exquisite loveliness of marvelous sunrises over the pure limpid waters of the *Estrecho Infernillo* is mystical.

134 The soil is loose and sandy, unsuitable for cultivation, and im-
241 possible for producing domestic crops of any
142 kind.

123 484 it from shore by a paddle. A little child in the boat sat still as a mouse. No matter how the boat rocked, it never whimpered or cried. All the children stayed perfectly quiet in the frail crafts, in the very positions in which they were placed.

123 484 136 220 Once the boat approached shore to secure a small octopus for fish bait. One was finally located by Stanley, who could see its eyes shining with a baleful purple light under a large boulder in about eighteen inches of water. The Seri got out and pinned it down with an oar, while Roberto pounded it time and time again with another oar. Even then it escaped in a cloud of sepia which it discharged. Its tentacles were easily a foot in length, and its color was the bottom of the sea. If it once gets a grip on a rock it is practically impossible to tear it loose.

Schools of porpoises played close to the boat each day, curving up to breathe and throw spray and then diving lazily below the surface, frequently gliding like a dark shadow below the waves. Sometimes, in the sheer joy of living, they would leap clear of the water and splash back in a spray of foam.

123 484 [208] We soon reached the extreme point where it juts from the Sonora shore, landed and set a signal smoke to notify other Seris on the Island. (A dry *pitahalla* cactus was selected for a black smoke.) No answering signal came. We crossed the narrow channel, the Infernillo, a little over a mile wide, the water like a mill pond, and landed on the sheltered side and unloaded on the stony beach. For miles the beach was covered by windrows of round wave-worn rocks and pebbles of all beautiful colors and sizes mingled with strange shells and seaweed. Here we made camp and stayed overnight.

The Indian canoe landed its cargo of women, children and dogs a little later, and established a camp adjoining. Three little boys were commissioned to secure us some clams and they returned in a while with a pail of clams, one crab and some oysters. These were boiled in salt water, the meat extracted and Pancho Oliverria cooked them in rice for supper. The crab was my especial delicacy.

123 Roberto and Stanley walked off after dinner to hunt in the mountains a few miles back from the coast, and they returned long after dark very weary from carrying, for seven miles, a young burro deer which they had shot. The Indians soon gathered around it chattering volubly, as both they and ourselves had eaten no meat for several days. We gave them nearly three-fourths of it, reserving a hind quarter and some ribs for ourselves. Rafael Feliz and Chico, with skill born of long practice, skinned and unjointed the animal in a very short time, and devoured a good part of their share in a cooking pot a little later, although they had eaten only a little while before. The boys cracked the bones and scraped the marrow, eating it like candy.

[484] At six thirty the next morning, we were crowded in the boats again

Band V

642 [226] [501] [721] These people were apparently hunters, gatherers, and fishermen. It is said that they speared fish from the shore since they did not use *balsas*. They too apparently raided the ranches. Their warring nature has already been discussed; it resulted in the [582] [628] acquisition of few friends. However, several marriages between members of this band and members of subdivision 2 of Band III are said to have occurred.

Band VI

[131] [342] [601] [411] [262] The members of Band VI lived on San Esteban Island and were the most primitive of the tribe. They lived in huts made of driftwood and in caves and made extensive use of the *balsa*. Although they did not have the bow and arrow, they did become expert in the use of the spear. The people depended mainly on a seafood, iguana, and maguey diet.

621 628 578 [157] Perhaps it was due to the confined living space on the small island with the accompanying lack of fresh water that relations between the four subdivisions were precarious and fights broke out frequently. The Seri today stress the fact that the members of this band were impetuous and unpredictable.

642 [574] [628] Their relations with the other bands were generally good however. Seri from Band III were free to visit San Esteban where they were well treated.

[484] [191] [648] The San Esteban people seldom traveled to the mainland, and, since they spoke no Spanish, it is probable that they made no peaceful contact with non-Seri groups.

COLLAPSE OF THE BAND SYSTEM

642 628 578 648 Internal strife in the Seri tribe was probably a major factor in the establishment of the band system. External strife was a major factor in its downfall.

[921] Reference has been made to the plundering, killings and rustling of cattle to which certain of the bands were dedicated. The concern of the Sonora government was aroused, and steps were taken to crush the rebellious groups. According to the present-day Seri, military action by army units and rancher outfits against the various bands resulted in the near-destruction of the whole tribe.[11]